

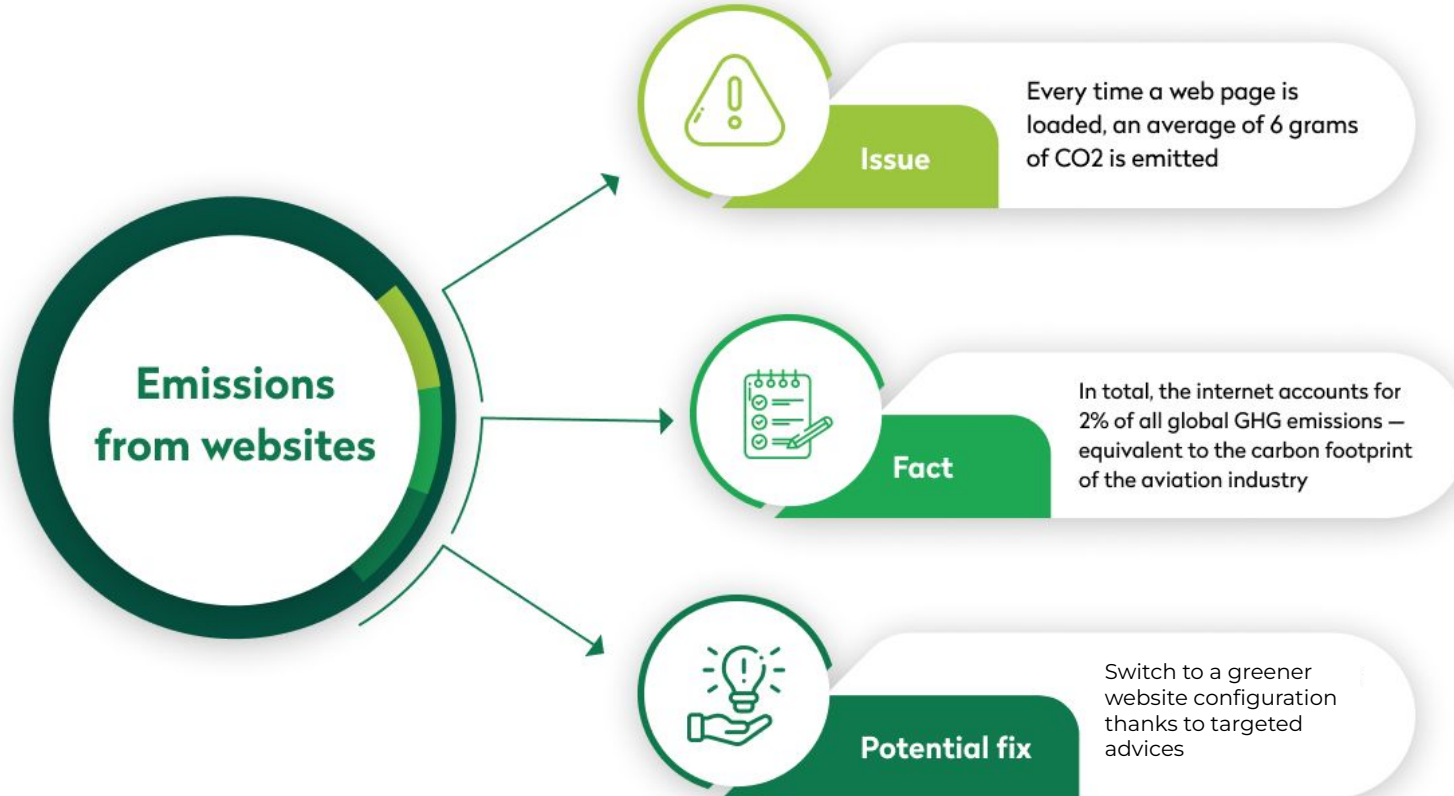
Towards a greener Web



Machine Learning for
Climate

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Website Hosting



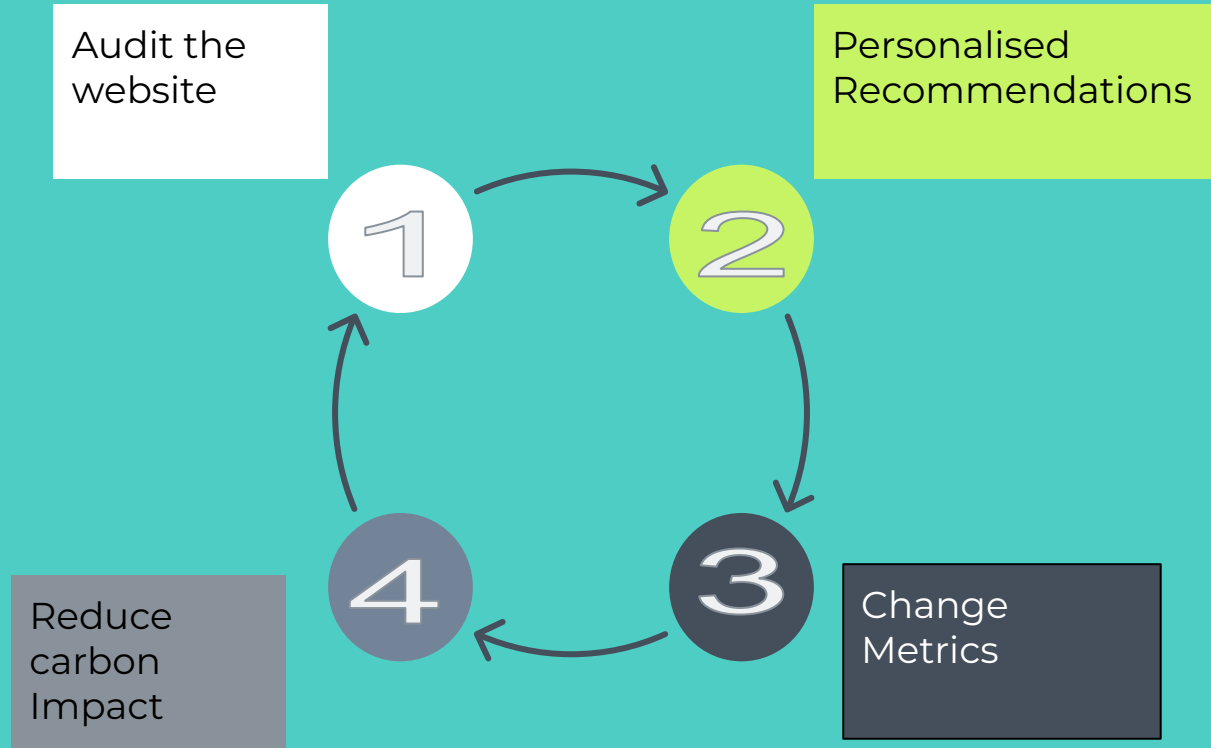
Goal: Increase the website's grade

	grade	addExpiresOrCacheControlHeaders	compressHttp	domainsNumber	dontResizeImageInBrowser	externalizeCss
0	E	50	75	0	20	0
1	B	0	75	0	100	75
2	C	0	35	0	35	50
3	A	0	0	100	100	75
4	F	50	75	0	20	0
...
550	G	75	75	0	0	0
551	F	75	50	50	0	0
552	C	0	0	65	100	100
553	D	0	0	65	100	100
554	D	0	0	65	100	100

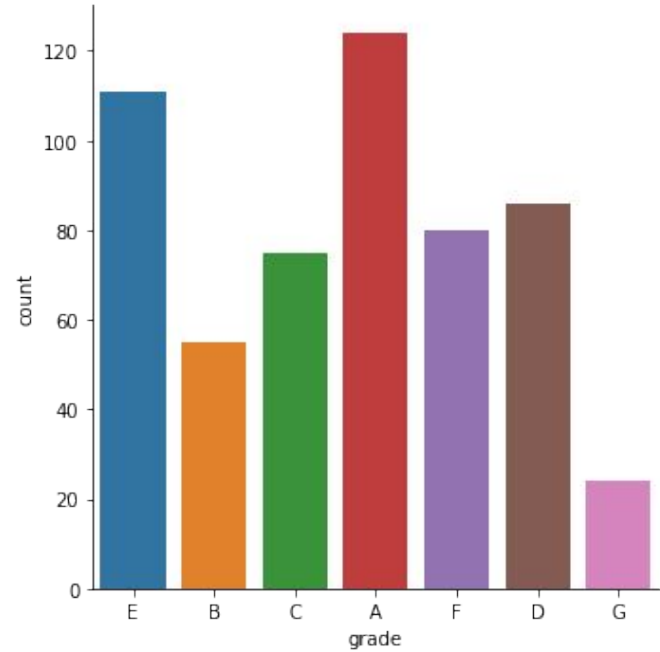
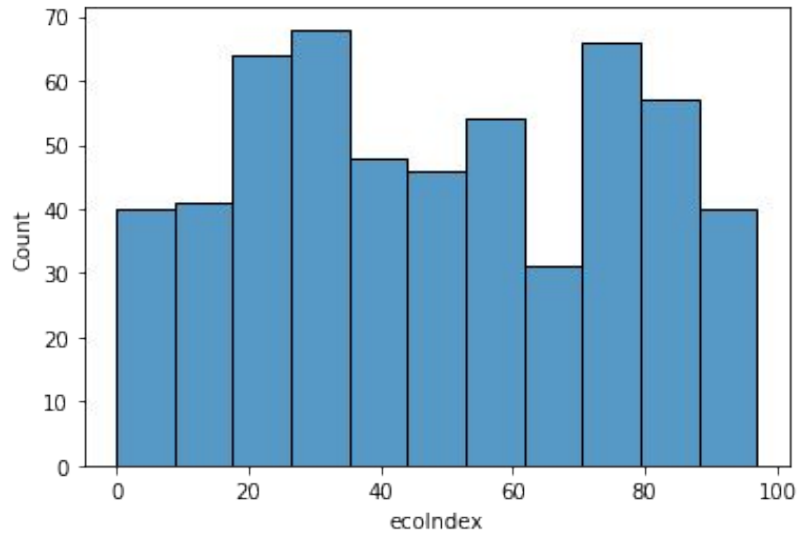
555 rows x 53 columns

Score =
level of
implementation
of the feature

Which **feature** should the website change?



EcoIndex



$$Ecoindex = 100 - \frac{5 * [3 * Fd(Taille_{DOM}) + 1 * Fs(Poids_{page}) + 2 * Fr(Nb_{Requêtes})]}{6}$$

taille du DOM	Nb request HTTP	Poids de la page	<u>Ecoindex</u> (plus c'est haut, mieux c'est)	Note de A(meilleur) à G(pire)
235	30	500 Ko	76	A
390	35	1000 Ko	66	B
560	59	1500 Ko	51	C
655	75	20000 Ko	36	D
1000	110	35000 Ko	21	E
1500	200	60000 Ko	6	F
2000	300	70000 Ko	2	G

DomSize

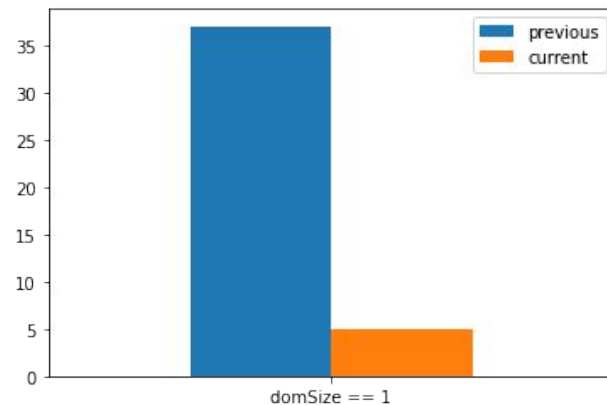
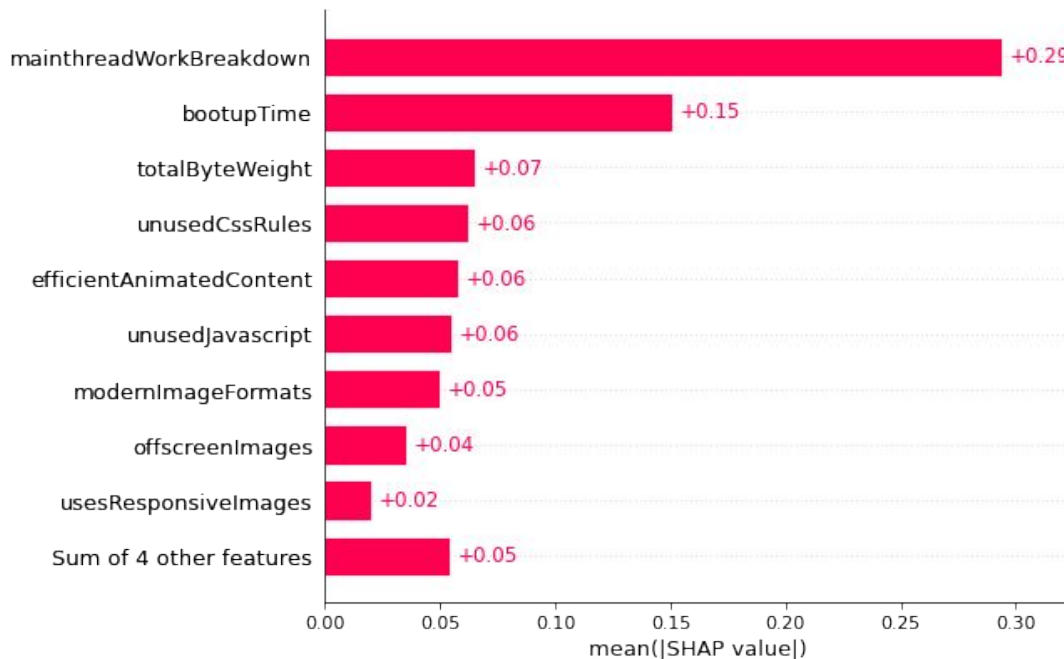
Random Forest

model score on training data : 0.85

model score on testing data: 0.82

New artificial Dataset:

Increase low DomSize's
features Importance



NbRequest

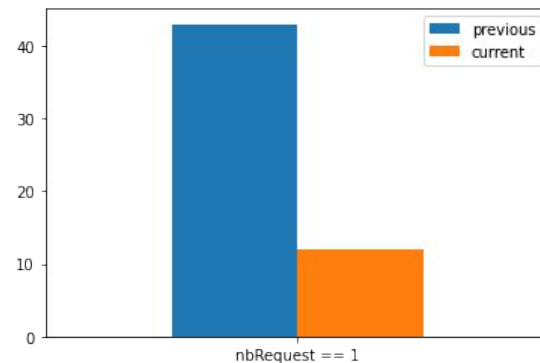
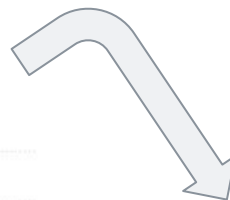
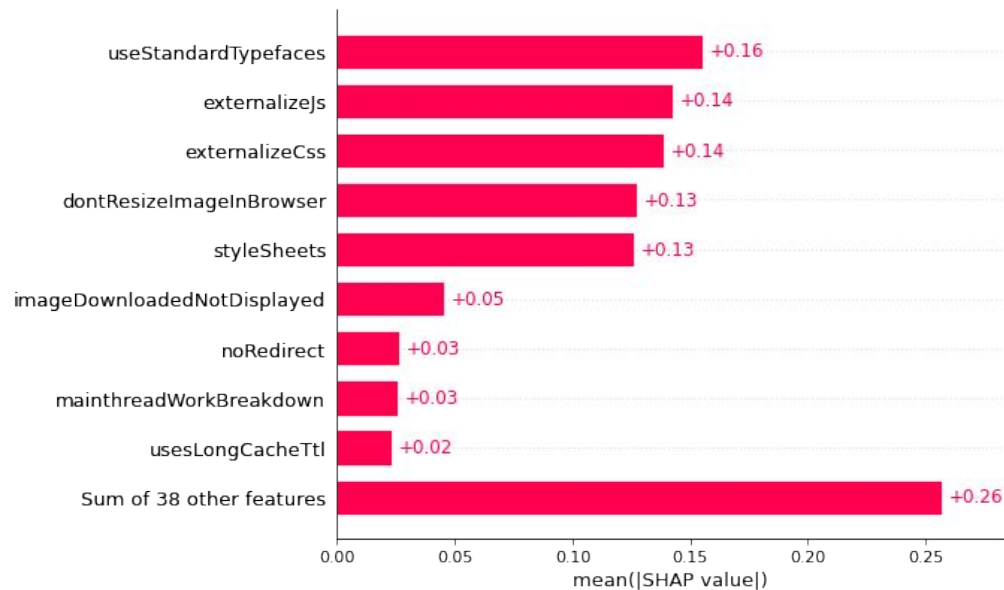
Random Forest

model score on training data : 0.68

model score on testing data: 0.64

New artificial Dataset:

Increase low
Nbrequest's
features
Importance



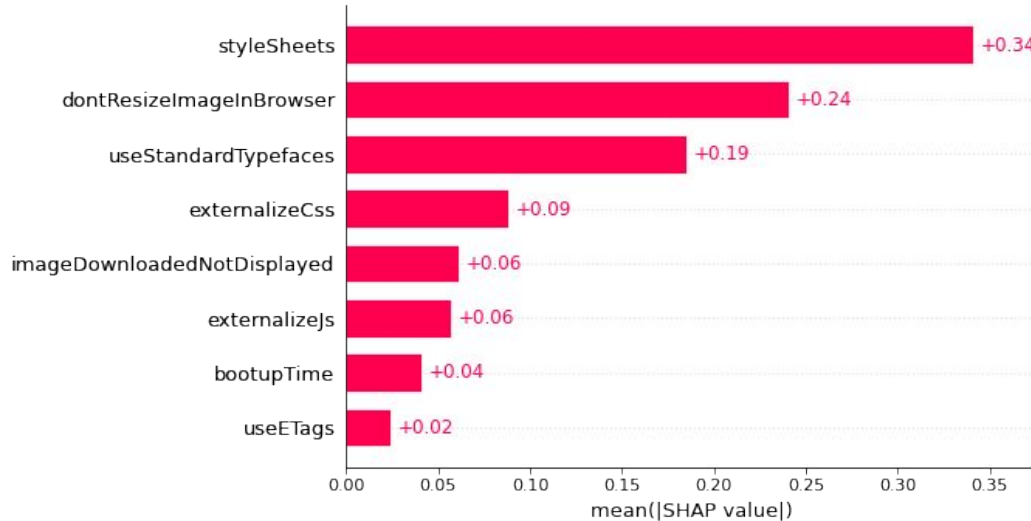
ResponseSize



Random Forest

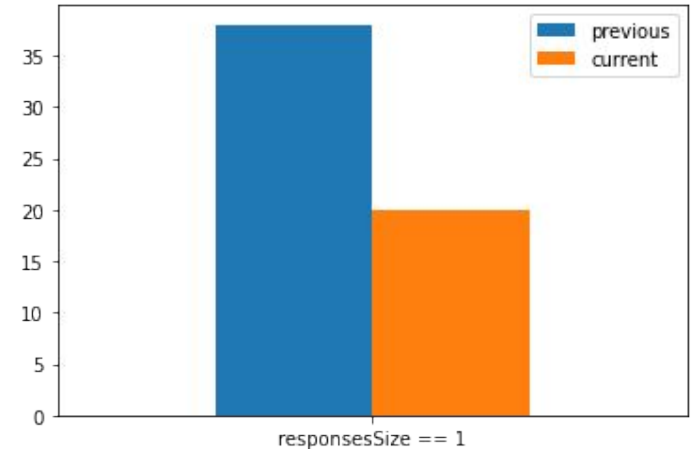
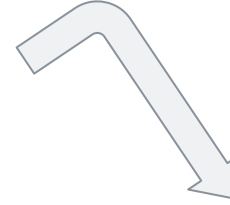
model score on training data : 0.70

model score on testing data: 0.64



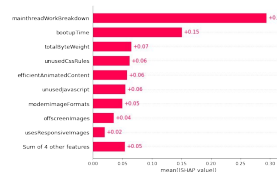
New artificial Dataset:

Increase low Response's
features Importance





$$Ecoindex = 100 - \frac{5 * [3 * Fd(Taille_{DOM}) + 1 * Fs(Poids_{Page}) + 2 * Fr(Nb_{Requêtes})]}{6}$$



Implementation

Example



`display_recommendation(First_Recommendation)`



Recommendations:

- 0 unusedCssRules
- 1 efficientAnimatedContent
- 2 modernImageFormats
- 3 usesResponsiveImages
- 4 bootupTime
- 5 offscreenImages
- 6 usesTextCompression
- 7 usesHttp2
- 8 mainthreadWorkBreakdown
- 9 totalByteWeight
- 10 usesLongCacheTtl

Thanks!

Any questions?